Special Issue

Advanced MIMO Technologies in Wireless Communications: Innovations and Future Prospects

Message from the Guest Editors

As 6G approaches, MIMO technology is advancing toward the realization of ubiquitous coverage, ultra-high capacity, and intelligent adaptability. This Special Issue focuses on advanced MIMO technologies from three innovative perspectives: network architecture, the antenna scale, and antenna hardware. From a network architecture perspective, cell-free massive MIMO distributes access points across wide areas to provide ubiquitous service without traditional cell boundaries. At the antenna-scale level, two prominent trends are observed: extremely large-scale MIMO, characterized by an increasing number of antenna elements, and holographic MIMO, featuring a denser arrangement of antenna elements. Meanwhile, innovations in antenna hardware, including fluid/movable antennas and reconfigurable intelligent surfaces, are enabling wireless systems to actively adapt to and even customize evolving environments, improving flexibility and robustness. Despite significant progress, key challenges remain. This Special Issue invites contributions that address these challenges and advance the practical implementation of next-generation MIMO systems.

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Electronics is a multidisciplinary journal designed to appeal to a diverse audience of research scientists, practitioners, and developers in academia and industry. The journal is devoted to fast publication of latest technological breakthroughs, cutting-edge developments, and timely reviews of current and emerging technologies related to the broad field of electronics. Experimental and theoretical results are published as regular peer-reviewed articles or as articles within Special Issues guest-edited by leading experts in selected topics of interest.

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